SEPTEMBER 12, 2000

The New Spotter Program Manager

Hello all! My name is Shane Snyder and I am your new spotter program manager here at the Bay Area National Weather Service. I wanted to start this newsletter with a word about myself. I was born in 1974 in Baltimore, Maryland where I lived and attended school, including two years of community college, from which I graduated with an Associate in Arts degree in 1994. In the fall of 1995, I moved on to Millersville University in Lancaster, Pennsylvania...where I proceeded to pursue my Bachelor in Science degree in Meteorology. Due to a deep fascination in the weather and the help of great professors and friends, I graduated in December, 1998.

After graduation, I took a couple months to rest (whew! I needed it) and came out to southern California to spend some time with my then good friend Erin and to see some relatives in the Los Angeles area. It is a fateful thing that I took the time to come out to California, because my good friend Erin is now my wonderful wife!

In March 1999, I went back to Baltimore to search in earnest for my career in meteorology. After a couple months searching, I was picked for a position at the National Weather Service in Albuquerque, New Mexico. It was a temporary position to last no more than 13 months, but it was my ticket into the Weather Service. While I was in Albuquerque, I learned much about the job of an intern.

By December 1999, my decision to take the Albuquerque position paid off...I was selected for a permanent position here in Monterey! I was very happy to come to Monterey...I have always wanted to live in California.

Well, that's enough about me. I look forward to working with as many of you as possible as weather threatens the Bay Area. Keep your eyes to the sky!

SHANE SNYDER
SPOTTER PROGRAM MGR
(831) 656 - 1710

In this issue...

Thanks to All

I want to take this opportunity to thank the entire spotter network for doing such a great job in keeping us informed of important weather happenings around the region. Without the help of spotters, we would never get the detailed information that is crucial in verifying or characterizing what is going on around our large forecast area. The information we receive can be critical in deciding whether or not to issue warnings for potentially dangerous or even life-threatening situations (such as flash flooding, high winds, or even the rare severe thunderstorm). I know that the weather around our area can be quite uneventful for long periods of time, but when the weather does turn ugly it is good to know that we have a great network of spotters to back us up!

From the MIC: Return to the San Francisco Bay Area

I am very pleased to return to Monterey as the new Meteorologist in Charge for the San Francisco Bay Area. My birth place is San Jose, California and am returning to the Bay Area for the third time in my National Weather Service Career. I started in the mid 80s as an Intern Meteorologist at the Forecast Office located in Redwood City California. I returned in the mid 90s as Deputy Meteorologist in Charge of the Forecast Office at Monterey California. And now I have return once again as the Meteorologist in Charge. I love the area and am excited about working with you, our valued spotters.

Your assistance in our Warning Program is not only vital but also very appreciated. Your dedication and desire to be a part of a large network of spotters to assist in warning your communities of impending severe weather is admirable! I thank you and look forward to working with you to continue to build a pro-active and efficient spotter network. We may not see the tornado outbreaks of the plains; however, we in California do have our own severe weather...be it flooding, wind storms, and, yes, even tornados.

Thank your for your continued support,
Sincerely,

Robert Diaz, Jr.
Meteorologist in Charge
San Francisco Bay Area
(831)-656-1710 x222

Future Training

Although there is nothing officially planned yet for training, I will be looking into possible sessions in the next several months. As always, if anyone knows of a facility that would be available for training, please contact me at **831-656-1710** or email me at Shane.Snyder@noaa.gov. Also, I would be enthusiastic about speaking at a club meeting to teach a weather topic or to give information about the spotter program. Thanks for your patience and/or support.

La Nina: Forecast and Impacts on California Rainfall

According to the latest analysis, the Climate Prediction Center (CPC) has noted a continuation, albeit weakening, of La Nina (or cold episode) conditions in the tropical Pacific Ocean. Sea surface temperatures in the western and central Pacific continue to show a negative anomaly of up to 2 to 3 degrees centigrade (see figure 1), as they have since late 1998. In addition, a good atmospheric signal of La Nina, a positive equatorial Southern Oscillation Index (SOI), continues in the tropical Pacific. However, although the index is positive, it has weakened from its high of 3.2 in January to 1.2 in June (indicating the weakening of La Nina).

The equatorial SOI is a measure of the difference in average pressure from two points in the west-central equatorial Pacific, one further west and one further east. The index subtracts the

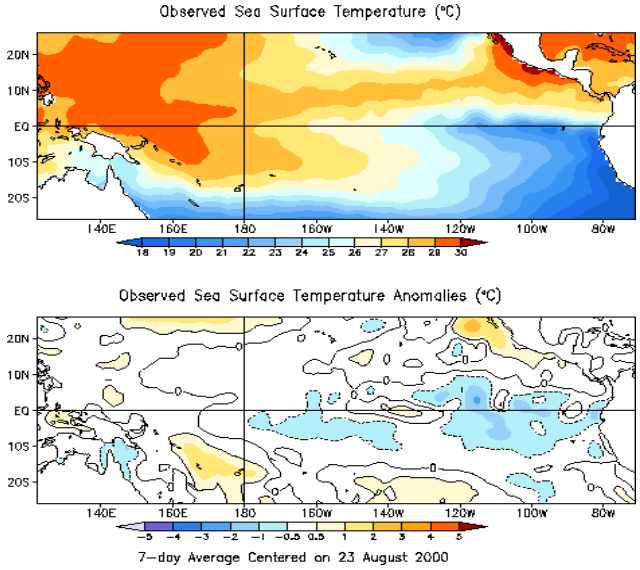

Figure 1

western point from the eastern point. If the index is positive, as it is now, then we know the average pressure is higher to the east than to the west. Since air travels from higher to lower pressure, the resultant easterly wind generated aids the already present easterly trade winds of the tropics, so there is in effect a stronger trade wind than normal. This enhancement of the trade winds helps to push the normally colder waters of the eastern Pacific westward, which creates a belt of anomalously cold water in the central and western equatorial Pacific (note the tongue of cooler water near the equator extending out from South America in Figure 1).

The CPC forecast for the rest of 2000 indicates continued weakening of the La Nina conditions over the next few months with near normal sea surface temperatures by the end of the year.

So, you might ask, what does all this mean for the folks here in the San Francisco and Monterey Bay areas? Unlike El Nino years, when a powerful winter jet stream developed by the anomalously warm Pacific waters brings tremendous amounts of moisture to the California coast (especially southern California), La Nina years tend to be much more tranquil. The average winter jet stream in La Nina years tends to be more variable than in El Nino years (see figure 2). In addition, it tends to be focused well to the north of California on average. This leads to the higher possibility for above average seasonal rainfall totals well to our north (especially during the winter), with around average totals on the central California coast, to below normal totals in southern California.

Climate record for the Oregon coast indicate a slightly above average seasonal rainfall

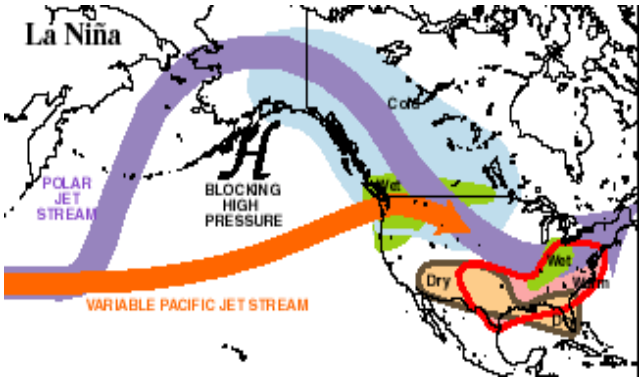

Figure 2

total (season runs October 1 to September 30) so far. However, although the season is just slightly above normal so far, the spring was quite wet. In the Seattle, Washington area, total rainfall is running about average so far, but last winter was quite wet...as would be expected in a La Nina winter. For the San Francisco and Monterey Bay areas, seasonal totals turned out to be normal to a bit above normal (121% of normal for downtown San Francisco). Finally, on the opposite end of the spectrum, San Diego and Los Angeles topped out at about 60 to 80% of their average, respectively. So the theoretical La Nina rainfall distribution discussed previously has actually held up fairly well in reality.

To conclude, with conditions edging back to near normal by the end of the year according to forecasts, the El Nino/La Nina cycle probably will not play much of a role in shaping this coming winter's rainfall totals. As for the fall, the El Nino/La Nina cycle does not usually affect California's rainfall totals during these seasons since the jet stream, which steers our rainfall according to its position, is on average far to the north of the region.

For updates on the ENSO (El Nino/ Southern Oscillation) cycle, visit our website at http://nws.mbay.net or the Climate Prediction Center web site at http://www.ncep.noaa.gov

Sources: Climate Prediction Center
San Francisco State University

A Warm January - June for the U.S. and the World

The National Oceanic and Atmospheric Administration (NOAA) has reported that January through June of this year was the warmest first half of a year overall on record for the United States in 106 years of record keeping. The 106 years of data was collected by the world's largest statistical database at the National Climate Data Center in Asheville, North Carolina. Every state in the contiguous U.S., except Georgia and South Carolina, was within the warmest one-third of all years for January through June.

For the world, temperatures were above the long-term average as well for January through June. The average global surface temperature was 1.42 degrees above the 1880 - 1999 average, which ties the first six months of this year for the third warmest. Additionally, sea surface temperatures were 0.49 degrees above the long term average for the world. The overall anomaly for land and sea was tied for the fifth warmest on record.

AWIPS Commissioned

On May 10th, the Bay Area National Weather Service joined many other National Weather Service offices nationwide when its AWIPS (Advanced Weather Interactive Processing System) was commissioned. Commissioning involved the complete withdrawal from the use of the old AFOS system, which had been used in collaboration with AWIPS since March, 1999. For those who were unaware, AWIPS is a powerful forecasting tool for the National Weather Service which includes graphical model data, current imagery from satellite and radar sources, current and forecast text products, and much more in a user-friendly computer interface.

In addition to the commissioning, an updated software version of AWIPS was installed on May 31st. The updated version includes new features to aid our marine forecasters and more graphical model data.

New MM5 Model from the Naval Postgraduate School

The mesoscale model (MM5)*, which was added to the model data suite of AWIPS this summer, is a valuable addition to the current forecasting tools available to our local office. A main advantage of the MM5 lies in its ability to "see", or resolve, smaller scales compared to traditional larger scale models used in forecasting. Resolution is a measure of how small of a scale that a model can discern terrain or weather features. The better a model "sees" the small details of terrain or weather features, the better it can forecast the nuances in the forecast that the small details can cause. A typical larger scale model needs enormous computing power to forecast the huge number of variables that are necessary to account for when predicting the weather. Since large scale models forecast for continental or global-sized areas, they must sacrifice the best possible resolution for the very large forecasting regions, due to limitations in computing power.

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* Mesoscale models refer to smaller scale models compared to traditional models which forecast for the entire country or world, they typically specialize in forecasting for a smaller, regional area.

Mesoscale models, on the other hand, are

only attempting to forecast for a specific, much smaller, area. This allows the MM5 to increase dramatically its resolution by sacrificing the size of the forecast area- which is a crucial advantage in areas as topographically complex as the central coast of California.

Summary of January - June Events

Precipitation totals through the end of 1999 were well below normal around the region. A review of five official climatology sites in the Bay Area shows a range of between 32% of normal for downtown San Jose to 52% of normal for downtown San Francisco:

SITE	Rainfall	PON
Downtown Oakland	3.72"	44
San Francisco Airport	2.64	35
Downtown San Francisco	4.28	52
Downtown San Jose	1.71	32
Downtown Santa Rosa	5.45	44

******PON = Percent of normal (rainfall)**

JANUARY - a dry start finishes wet

The first half of January remained quite dry as a persistent ridge of high pressure shunted storms well to the north of the Bay Area. However, by January 15th and 16th, a trough of low pressure off of the Pacific Northwest coast finally displaced the stubborn ridge. A moist southwest flow out of the subtropics ahead of the trough set up the first decent rainfall of 2000 for the area. Rainfall totals from the 15th through the 16th ranged from 0.75" in San Jose to over 1.50" in San Francisco to 3.81" at Big Sur on the Monterey County coast. Since the ground was so dry previous to the storm, there were only minor problems associated with the rains.

The most significant storm of the month came between January 22nd and January 25th as a slow-moving system off of northern California in addition to ample moisture flowing in from the southwest created an extended rain event, which stirred up some havoc for the area. Flash flood watches and urban flood advisories were issued as creeks began to rise and streets turned into ponds around the Bay Area. A San Francisco spotter reported areas of Interstate 280 and streets in the city underwater at 1 PM on the 23rd. In San Jose, a K-Mart roof succumbed to rain accumulation on its roof at about 10 PM on the 22nd. Additionally, as the ground began to saturate from the second major storm of the month, mudslides began to occur around the region. In Santa Cruz County, a few roads were closed due to slides and the Soquel River flooded some low-lying areas along its banks near Soquel.

Here are some impressive spotter rainfall totals for the January 22nd - 25th storm:

James Maldi Boulder Ck. (Santa Cruz Co.)	12.67"
Sherwin MacKenzie Mt. Hermon (Santa Cruz Co.)	11.73"

Additionally, data from McQueen's Ridge and Ben Lomond in the Santa Cruz mountains showed between ten and twelve inches of rain fell between 1 AM January 23rd and 1 AM January 25th. Heavier totals from the official climate sites included downtown Oakland and downtown San Francisco with 5.37 and 4.08 inches, respectively. Note the major decrease in rain totals from mountain sites (the spotter reports are also in the mountains) to the lower elevation climate sites. This is a classic example of the effect of terrain on the windward side of mountain ranges.

By the end of January, seasonal rainfall totals had received quite a boost from just two storms

during the second half of the month. Instead of between 30 and 50 percent of normal, the range for the official climate sites was up to between 60 and 80 percent. February would soon end any appreciable rain deficits in most areas.

FEBRUARY - winds, water, and mudslides

February started off quite windy as a system slid by south to north well off the coast on the 3rd. Southerly winds ahead of the system had winds gusting as high as 70 MPH near San Francisco (measured atop a 250-foot high crane at the San Francisco airport). Other reports include:

San Francisco Airport	52 MPH
San Carlos (spotter)	43 MPH
Salinas Airport	51 MPH
Monterey Airport	45 MPH

The winds caused about 31,000 people around the Bay Area to lose power, according to PG &E. In Santa Cruz County, trees were reported down on various highways.

The largest event of February occurred mid-month as a vigorous system affected the region with gusty winds and rain. Rainfall accumulations on the 13th and 14th topped 5" in many areas. In Santa Cruz County, Corralitos and Pescadero Creeks both crested three feet above flood stage, forcing evacuations along their banks. Bridges and some roads were washed out north of Santa Cruz. A spotter report from Mike Polanski in San Francisco on the 13th told of .10 inches in about 1 minute. Fortunately, this rainfall rate didn't continue for very long!

SOME STORM TOTALS FEB. 11 4pm – FEB. 14 4pm

BIG SUR (Monterey Co.)	8.47
KENTFIELD (Marin Co.)	7.38”
SANTA CRUZ	7.04”
RICHMOND (Alameda Co.)	5.01”
SANTA ROSA (Sonoma Co.)	4.85”

Mudslides also became more common in February as heavy rains drenched the steep hillsides of the region. Near Los Altos in Santa Clara County, a mudslide blocked two lanes of Interstate 280. Highway 1 was closed on the Big Sur coast of Monterey County due to a slide and was not open again for months. Also, mudslides in Daly City in San Mateo County forced the abandonment of a number of houses in danger of sliding down the crumbling hillsides.

Additionally, high winds knocked out power to as many as 42,000 residents around the Bay Area. A wind gust to 59 MPH was reported at Angel Island in San Francisco Bay.

All in all, the storm caused millions of dollars in damage throughout the area. However, it did get seasonal rainfall totals up to near or above average. Percentages by month's end ranged from 97% in Santa Rosa to 125% of normal in San Francisco and Oakland.

MARCH - a little more wind, southern snowcaps

On March 5th, the first snowcaps visible from Monterey Bay occurred as a very cold system swung through central California. Snow levels dropped to around 3,000 feet over Monterey County - low enough for a snowcap on Mount Toro, which is visible to the east of Monterey. Also, the first hail of the season in Monterey occurred as the core of the coldest air moved over the area Sunday into Monday.

Winds were once again a problem on March 19th as a tight pressure gradient developed at the surface and upper levels between high pressure over the Eastern Pacific and a low over the Four Corners region. Winds gusted to over 40 MPH around the Bay Area, which created the need for a wind advisory inland and a high wind warning for coastal areas during the afternoon and evening hours of the 19th.

Here are some wind reports on the afternoon of March 19th:

Point Reyes (Marin Co.) - Gusts to 72 MPH
Mount Tamalpais (Marin) - Gusts to 53 MPH
San Francisco Airport - Gusts to 39 MPH
Point Sur (Monterey Co.) - 35 MPH

Some trees and power lines lost the battle to the wind by the morning of the 20th, which caused some minor damage and power outages. Additionally, as an unwelcome bonus from Mother Nature, the spring pollen was kicked up nicely...which handed misery to hay fever sufferers all over the area.

By the end of March, percentage of normal rainfall around the region had lost some ground as the frequency and intensity of storms decreased (compared to previous months). However, most of the climate sites were still above normal for the year. Here are some totals through March:

SITE	RAIN	PON
Downtown Oakland -	23.10"	(116)
San Francisco Airport -	18.89"	(105)
Downtown San Francisco -	21.67"	(115)
Downtown San Jose -	13.69"	(106)
Downtown Santa Rosa -	26.13"	(94)

APRIL - warm start, wet middle

Surface high pressure built into the Great Basin (Nevada) at the end of March, setting up an offshore warming event for the beginning of April. Warming occurs as the clockwise circulation around the high pressure brings warm, continental air all the way to the coast from the east. It in effect slows or negates the normal westerly sea breezes, which act as the natural air conditioning of our region. Without the cooling sea breezes, temperatures can really heat up to well above seasonal normals. Here is a list of the record highs set April 1st and 2nd (official climate stations):

April 1st: Downtown San Francisco - 83
Oakland Airport - 84
Moffett Field (Mountain View) - 82
Downtown San Jose - 83
Downtown Santa Rosa - 88

April 2nd: San Francisco Airport - 85
Oakland Airport - 84

NOTE: The normal high for all these sites on April 1st and 2nd is in the 60s!

In addition to the warming temperatures, winds can also be a problem during offshore events. During this event, strong upper level winds out of the northeast were created between an upper level ridge building into the Pacific Northwest and an upper level low pressure system over Arizona. The combination of surface and upper level winds made it necessary to issue a wind advisory for the East Bay Hills (northeast winds accelerate through the gaps in the hills much like water through a constricting pipe) on Friday, March 31st. The advisory was canceled by April 1st as pressure gradients eased and allowed winds to subside to under criteria levels (35 MPH sustained winds and/or gusts to 45 MPH).

On April 16th and 17th, the last significant storm system of the year so far affected the area. Rainfall totals for the two days ranged from over two inches reported by a spotter in Fairfax (Marin Co.) to just under two inches at Big Sur to nearly 1.50" at San Rafael, Santa Rosa, Pacifica, and Kentfield. In addition to the rain, many spotter reports of pea-sized hail surfaced as the core of the cold system passed and freezing levels bottomed out across the area.

MAY - another heat wave

On May 20th, another offshore event developed for the Bay Area. By May 21st, temperatures soared as the normal sea breeze was cut off by the opposing offshore winds. Here is a list of high temperature records set for official climate stations on May 21st:

Downtown San Francisco - 90

San Francisco Airport	- 92
Moffett Field	- 96
Downtown Oakland	- 92
Downtown San Jose	- 97
Downtown Santa Rosa	- 96

NOTE: Normal highs for these sites on May 21st through May 23rd range from the upper 60s to the mid 70s (San Jose and Santa Rosa).

There were also some sizzling high temperature reports from our spotter network on May 21st:

Bill Weir (Burlingame - San Mateo)	100
Greg Gerhard (Cupertino - Santa Clara)	101
Bob Lindsay (Walnut Creek - Contra Costa)	98

Additional climate site records were set on May 22nd (San Jose - 96 and Santa Rosa - 97) and May 23rd (Santa Rosa - 97) as high pressure and the associated offshore flow continued. By the 24th, temperatures dropped back down to seasonal highs in the 60s and 70s as the offshore winds subsided and the normal sea breeze influence returned.

JUNE - not just another heat wave!

The memorable heat wave of June 13th through June 15th began on the 12th as an upper ridge of high pressure in the Eastern Pacific began to strengthen and build into the West Coast. As the upper level system built in, surface high pressure moved into Oregon and Washington. As the high pressure spread into the Great Basin - the stage for a classic offshore event was created (See page 10 for weather maps).

What made this event stand out from the rest of offshore events was the extraordinary strength of the upper ridge (602 decameters at its height on June 14th), which is an indication of unusually warm air aloft. Also, in addition to a very strong ridge aloft and a surface flow from the east, solar heating was at about its maximum for the year. All of these factors combined to shut down the cooling marine influence for a few sweltering days in the San Francisco and Monterey Bay areas.

The heat up began on June 13th with the first reports of highs over 100 degrees. Napa and Santa Rosa both reached 105 degrees and Kentfield, Vallejo, and Concord topped out at 103. A spotter in Burlingame reported a high of 104. Even downtown San Francisco reached 83 degrees...a good sign of offshore flow in progress!

On June 14th, as the ridge of high pressure reached its peak strength and the surface high strengthened in response (increasing the offshore more), the normal sea breeze influence was virtually eliminated. In response to possible all-time high temperatures, a heat advisory was issued for the *entire* San Francisco and Monterey Bay area on the morning of the 14th (including coastal areas!).

Temperatures by the afternoon of the 14th soared all the way to the coast as expected. Monterey recorded a high of 99 and Pacifica in San Mateo County recorded a high of 95. Three regular reporting sites reached or beat 110 degrees (Kentfield- 110, Vallejo- 110, King City- 112). Five of eight official climate stations topped their daily records for June 14th and three of those five tied or beat all-time high temperature records. San Jose weighed in with 109 degrees, beating the old all-time high of 107 set in 1972. Moffett Field (Mountain View) blew away the old all-time record of 102 set in 1988 with a sizzling 106 degrees. Finally, downtown San Francisco rounded out the list with an unbelievable 103, which tied the all-time record high temperature set in 1988.

Spotter reports were useful in completing the list of blazing temperatures on the 14th. Here are some high temperatures from around the area:

SPOTTER	LOCATION	
Bill Weir	Burlingame	112
Greg Gerhard	Cupertino	111
George Lee Roush	Concord	110
Janet Bossetto	Hayward	109
Bob Lindsay	Walnut Creek	106

In addition to the scorching highs around the area on the 14th, a record high minimum was set for San Francisco on the morning of the 15th. Even at 9:20 PM on the 14th, spotter Mike Polanski reported that the temperature was still 90 (after the high of 103)! By the morning of the 15th, the temperature had only fallen to 68 degrees...which set a new record high minimum (old record was 64 set in 1961).

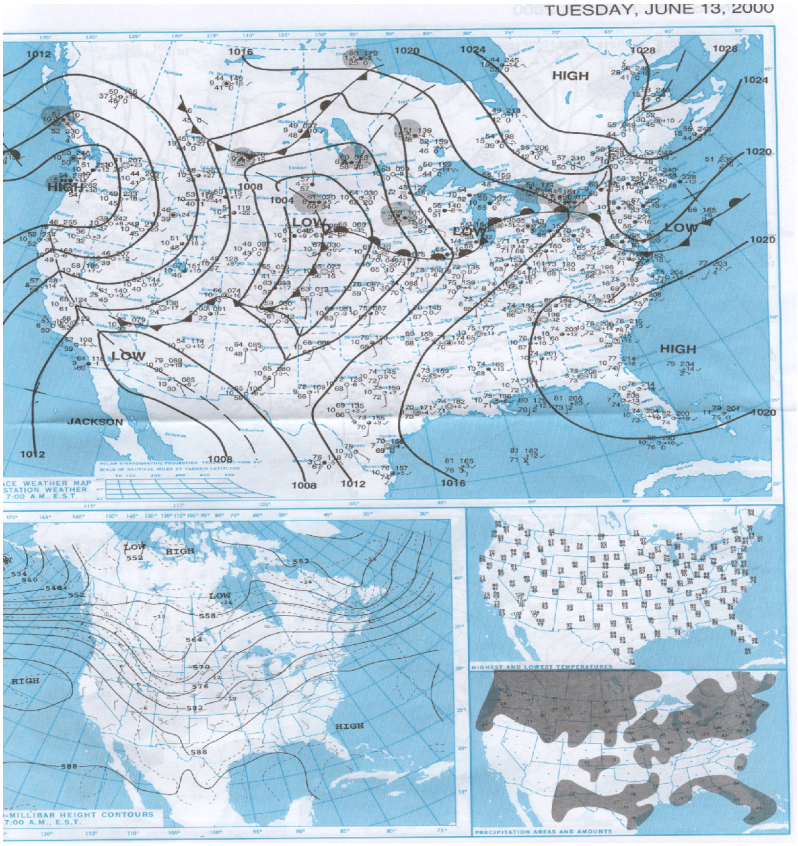
Temperatures lowered dramatically across the region by Thursday, June 15th as the massive ridge weakened and retreated to its normal position well off the Pacific Coast.

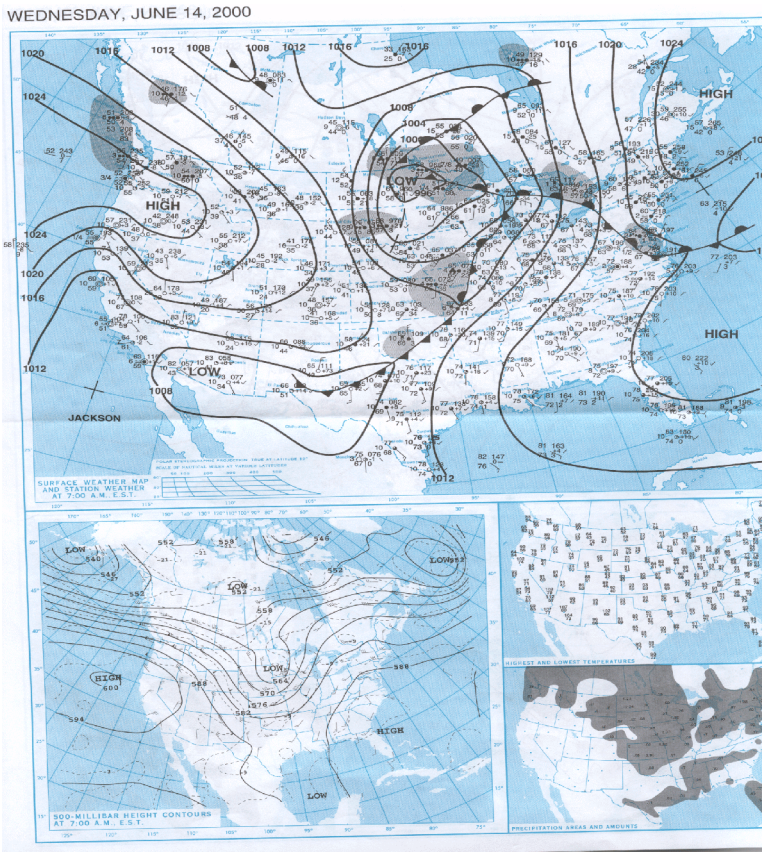
A FINAL WORD.....

Here is a summary of seasonal rainfall totals for a few select sites around the region (totals reflect July 1st, 1999 to June 30th, 2000):

SITE	Total	PON	Normal
Santa Rosa	29.90"	99	30.30
Oakland Museum	25.55	117	21.79
San Francisco (arpt)	20.85	106	19.70
Downtown SF	24.89	121	20.52
San Jose	15.33	106	14.42
Monterey	20.91	106	19.65
Big Sur	51.67	126	40.82

PON - percent of normal (for season). Normals are 1961 - 1990 averages except Oakland (1970 - 1990).


TUESDAY, JUNE 13, 2000
HIGH
LOW
JACKSON
SURFACE WEATHER MAP AND STATION WEATHER AT 7:00 A.M. E.S.T.
500-MILLIBAR HEIGHT CONTOURS
PRECIPITATION AREAS AND AMOUNTS


WEDNESDAY, JUNE 14, 2000
HIGH
LOW
JACKSON
SURFACE WEATHER MAP AND STATION WEATHER AT 7:00 A.M. E.S.T.
500-MILLIBAR HEIGHT CONTOURS AT 7:00 A.M. E.S.T.
PRECIPITATION AREAS AND AMOUNTS